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REMARKS

Favorable reconsideration is respectfully requested in view of the above amendments and following remarks. Claims 6-10 have been amended editorially. The amendment to claim 9 is supported by the original disclosure, for example, page 18, line 25 to page 22, line 21 of the specification. Claims 11-22 are new, and are supported by the original disclosure, for example, original claims 2, 3, 6 and 8-10 and page 4, line 2 to page 6, line 33 of the specification. Claims 1-5 have been canceled without prejudice or disclaimer. No new matter has been added. Claims 6-22 are pending.

Claim Rejections – 35 USC §112

Claims 1-10 are rejected under 35 USC 112, second paragraph, as being indefinite. As to claims 6-9, claim 6 is directed to a method of eliciting nitrogen absorption and protein synthesis in plants. Claim 6 recites administering to the plants or soils, an effective amount of ulvans, or a reaction product obtained from the treatment of the ulvans by chemical hydrolysis or enzymatic hydrolysis. Claim 9 is directed to a fertilizing product for eliciting nitrogen absorption and protein synthesis in plants. Claim 9 recites that the fertilizer product includes an effective amount of at least one of ulvans or a reaction product obtained from the treatment of said ulvans by chemical hydrolysis or enzymatic hydrolysis in combination with one or more fertilizing substances. The specification provides experimental data showing an increase in total amount of root proteins produced by each plant as compared to control plants when ulvans are used (see Example 4) as well as experimental data showing an effect of ulvans on mineral nitrogen absorption and confirming the stimulant effect of ulvans on the genes involved in nitrogen transport (Example 3). Accordingly, Applicants submit that it can be determined how much of the ulvans or the reaction product obtained from the treatment of said ulvans by chemical hydrolysis or enzymatic hydrolysis would constitute an effective amount. As to claims 6-8, claim 6 does not recite "it comprises" and "the application". As to claims 9-10, claim 9 does not recite "wherein is comprises". Claims 1-5 have been canceled. Accordingly, Applicants submit that claims 6 and 9 and their dependent claims are definite.

Claim Rejections – 35 USC §102

Claims 1-10 are rejected under 35 USC 102(b) as being anticipated by or, in the alternative, under 35 USC 103(a) as being obvious over Iqbal et al. (Pak. J. Bot. (1999),

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31(1): 193-198. *Studies on aqueous extracts of three green algae as an elicitor of plant defence mechanism.*). Applicants respectfully traverse the rejection.

Claim 6 is directed to a method of eliciting nitrogen absorption and protein synthesis in plants. Claim 6 recites administering to the plants or soils, an effective amount of ulvans, or a reaction product obtained from the treatment of the ulvans by chemical hydrolysis or enzymatic hydrolysis. Advantageously, when the method as recited in claim 6 is carried out, an increase in the total amount of proteins, for example root proteins, as compared to control plants as well as stimulation of the genes involved in nitrogen transport in the treated plants can be achieved (Examples 3 and 4).

The rejection contends that Iqbal teaches extracts of algae and the preparation of elicitors from *Ulva lactulus*, that the preparation method includes chopping, washing, and extraction, that acid hydrolysis is taught, and that the elicitor treatment and application to plants is also taught.

The rejection seems to assume that the extraction method taught by Iqbal would result in an effective amount of ulvans for eliciting nitrogen absorption and protein synthesis in plants. However, nothing in Iqbal teaches or even suggests the composition of the extract, let alone the presence of ulvans. In fact, the method taught by Iqbal is applied generally to *Codium elongatum* as well as *Caulepra texiflora*. However, neither *Codium elongatum* nor *Caulepra texiflora* even contain any ulvans. Therefore, the reference is far from even identifying the effects of ulvans, let alone teaching or even suggesting administering an effective amount of ulvans or the reaction product to elicit nitrogen absorption and protein synthesis in plants as recited in claim 6.

Moreover, Iqbal does not teach administering acid hydrolyzed extract of ulvans to plants. Specifically, Iqbal teaches that the acid alkali or aqueous extracts (cold/hot) were treated with ethanol to precipitate out the polysaccharides, and the precipitate was separated and freeze-dried so as to prepare the High Molecular Weight Crude Elicitor Preparations (HMWCEP; see page 194 under Crude Elicitor Preparations from Seaweed Extracts). Iqbal indicates that these high molecular weight crude elicitor preparations were evaluated for their elicitor activity (see page 193, last three lines of last paragraph).

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Iqbal further teaches that these preparations were prepared for separation using paper chromatography in order to analyze the monosaccharide composition of the polysaccharides within these preparations. In particular, Iqbal teaches hydrolyzing these preparations with acid, drying, and then separating the hydrolysates by paper chromatography (see page 194 under Acid Hydrolysis and Monosaccharide Composition of HMWCEP and page 196, middle paragraph). It is clear from the above discussion that Iqbal teaches that HMWCEP, as opposed to their hydrolysates, were applied to the cotyledons and does not disclose that the hydrolysates were used other than for analyzing the composition of the HMWCEP, let alone disclose that ulvans were hydrolyzed and applied to plants. Therefore, Iqbal fails to teach an effective amount of the reaction product obtained from the treatment of the ulvans by chemical hydrolysis or enzymatic hydrolysis for eliciting nitrogen absorption and protein synthesis in plants as recited in claim 6. Accordingly, claim 6 and its dependent claims are patentable over Iqbal.

Claim 9 is directed to a fertilizing product for eliciting nitrogen absorption and protein synthesis in plants. Claim 9 recites that the fertilizer product includes an effective amount of at least one of ulvans or a reaction product obtained from the treatment of said ulvans by chemical hydrolysis or enzymatic hydrolysis in combination with one or more fertilizing substances. Advantageously, when the fertilizer product as recited in claim 9 is applied to plants, an increase in the total amount of proteins, for example root proteins, as compared to control plants as well as stimulation of the genes involved in nitrogen transport in the treated plants can be achieved (Examples 3 and 4).

As discussed above, Iqbal indicates that extracts were prepared for each of the green algae. As shown in Table 3, the extracts for each of the green algae were tested individually and alone to evaluate their elicitor activity. However, nothing in Iqbal teaches or suggests a fertilizer product that includes ulvans or a reaction product obtained from the treatment of said ulvans by chemical hydrolysis or enzymatic hydrolysis in combination with one or more fertilizing substances.

Moreover, as is clear from the above discussion, Iqbal teaches the use of HMWCEP as an elicitor of plant defense mechanism, but fails to teach the presence of ulvans within the HMWCEP, let alone teach or suggest a fertilizer product that includes an effective amount of

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ulvans or the reaction product for eliciting nitrogen absorption and protein synthesis in plants as recited in claim 9. Accordingly, claim 9 and its dependent claims are patentable over Iqbal.

Claims 1-3, 6 and 9 are rejected under 35 USC 102(b) as being anticipated by or, in the alternative, under 35 USC 103(a) as being obvious over Briand et al. (US 5508033). Claims 4, 5, 7, 8 and 10 are rejected under 35 USC 103(a) as being obvious over Briand et al. (US 5508033). Applicants respectfully traverse the rejections.

Briand indicates that their invention is based on the unexpected discovery that the extracts of certain algae have an anti-radical activity towards the superoxide radical (col. 1, lines 16-18). Briand indicates that particular active substances isolated from algae extracts have anti-radical activity, and that these active substances are fucols, polyfucols, diphloretols, polyphloretols, bifuhalols, polyfuhalols and phloterols (col. 6, lines 5-9). However, nothing in Briand teaches or even suggests the use of ulvans or a reaction product obtained from the treatment of the ulvans by chemical hydrolysis or enzymatic hydrolysis. Therefore, the reference is far from even identifying the effects of ulvans or the reaction product obtained from the treatment of the ulvans, let alone teaching or even suggesting administering an effective amount of ulvans or the reaction product to elicit nitrogen absorption and protein synthesis in plants as recited in claim 6.

As to claim 9, Briand teaches preparations of extracts of green algae that include substances that have anti-radical activity towards superoxide radicals and that these preparations can be used in crops (col. 7, lines 34-39). However, Briand is silent as to the presence of ulvans or a reaction product obtained from the treatment of the ulvans by chemical hydrolysis or enzymatic hydrolysis in any of these preparations, let alone teach or suggest that any of the preparations contain an effective amount of ulvans or the reaction product obtained from the treatment of the ulvans by chemical hydrolysis or enzymatic hydrolysis for eliciting nitrogen absorption and protein synthesis in plants as recited in claim 9. Accordingly, claims 6 and 9 and their dependent claims are patentable over Briand.

Claims 1-4, 6 and 9 are rejected under 35 USC 102(a) as anticipated by or, in the alternative, under 35 USC 103(a) as obvious over De La Fuente et al. (EP 1437334). Claims 5, 7, 8 and 10 are rejected under 35 USC 103(a) as obvious over De La Fuente et al. (EP 1437334). Applicants respectfully traverse the rejections.

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De La Fuente is directed to an organic fertilizer complement and a method of making the organic fertilizer complement. The reference indicates that the process for obtaining the complement requires washing, grinding, acid and alkaline digestion of green or brown algae so as to obtain a high extraction yield of potassium alginate (paragraphs [0013]). However, nothing in De La Fuente teaches or even suggests the use of ulvans or a reaction product obtained from the treatment of the ulvans by chemical hydrolysis or enzymatic hydrolysis. Therefore, the reference is far from even identifying the effects of ulvans or the reaction product obtained from the treatment of the ulvans, let alone teaching or even suggesting administering an effective amount of ulvans or the reaction product to elicit nitrogen absorption and protein synthesis in plants as recited in claim 6.

As to claim 9, De La Fuente teaches preparing extracts of green algae so as to obtain high extraction yields of potassium alginate, and these preparations can be used as vegetal growth stimulators (paragraph [0012]). However, De La Fuente is silent as to the presence of ulvans or a reaction product obtained from the treatment of the ulvans by hydrolysis or enzymatic hydrolysis in any of the these preparations, let alone teach or suggest that any of the preparations contain an effective amount of ulvans or the reaction product obtained from the treatment of the ulvans by chemical hydrolysis or enzymatic hydrolysis for eliciting nitrogen absorption and protein synthesis in plants as recited in claim 9. Accordingly, claims 6 and 9 and their dependent claims are patentable over De La Fuente.

Double Patenting

Claims 1-10 are provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1-10 of copending Application No. 10594692 (Briand et al.). Applicants respectfully traverse the rejection.

Claim 6 of Briand et al. is directed to a method for activating, *in vivo*, plant defense and resistance reactions against biotic or abiotic stresses. Claim 6 of Briand et al. recites administering, to plants, an effective amount of (1) ulvans extracted from green algae of the genus *Ulva* or *Enteromorpha*, or (2) a reaction product obtained by hydrolysis or enzymatic hydrolysis of the ulvans of (1), wherein administering to the plants is effected under *in vivo* conditions. On the other hand, claim 6 of the present application is directed to a method of eliciting nitrogen absorption and protein synthesis in plants. Claim 6 recites administering to

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the plants or soils, an effective amount of ulvans, or a reaction product obtained from the treatment of the ulvans by chemical hydrolysis or enzymatic hydrolysis. Claim 9 of the present application is directed to a fertilizing product for eliciting nitrogen absorption and protein synthesis in plants. Claim 9 recites that the fertilizer product includes an effective amount of at least one of ulvans or a reaction product obtained from the treatment of said ulvans by chemical hydrolysis or enzymatic hydrolysis in combination with one or more fertilizing substances. Claim 6 of Briand et al. therefore fails to recite an effective amount of ulvans or the reaction product obtained from the treatment of said ulvans for eliciting nitrogen absorption and protein synthesis in plants as recited in claim 6 and 9 of the present application. Claim 6 of Briand et al. also fails to recite a fertilizer product that includes an effective amount of ulvans or the reaction product in combination with one or more fertilizing substances as recited in claim 9 of the present application. Therefore, claim 6 and 9 and their dependent claims of the present application are patentable over Briand et al.

In view of the above, favorable reconsideration in the form of a notice of allowance is requested. Any questions or concerns regarding this communication can be directed to the attorney-of-record, Douglas P. Mueller, Reg. No. 30,300, at (612) 455.3804.

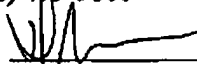


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Respectfully submitted,

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